Denver Water Notes

1. All materials and workmanship shall be in conformance with the Denver Water Engineering Standards, Materials Specifications and Drawings. All main installations/system modifications shall be approved and inspected by Denver Water.

2. All water mains installed shall conform to Denver Water Materials Specifications:

Ductile Iron	MS-1	4" & 20" Class 51/with Poly Wrap 6" through 16" Class 50/with Poly Wrap
Polyvinyl Chloride (PVC)	MS-2	4" Class 200 6" through 12" Class 150

Note: All fire hydrant laterals and fire lines shall be Ductile Iron Pipe.

3. Mechanical joint restraint devices shall be:

For Ductile Iron Pipe:
- MegaLug 1100 Series
- Romal ROM Grip
- Uni-Flange 1400 Series
- Star Grip 3000 Series
- Sigma-One Lock

For PVC Pipe:
- MegaLug 2000 PV Series
- Sigma-One Lock
- Star

4. Pipe joint restraint devices shall be:

For Ductile Iron Pipe:
- MegaLug 1700 Series
- US Pipe Field Lok Gasket

For PVC Pipe:
- MegaLug 1500 PV Series

5. Tracer wire, gauge 12, shall be installed on all non-metallic water mains.

6. All fittings shall be made from gray-iron or ductile iron and furnished with mechanical joint ends. All fittings shall have a pressure rating of 250 psi and shall be wrapped with an 8-mil minimum thickness polyethylene material per AWWA Standard C105 (MS-3).

7. There shall be a minimum cover of 4.5 feet over all water mains.

8. Fire hydrants shall conform to Denver Water MS-12 Materials Specifications. Fire hydrant assemblies shall include all pipe, fittings, valves, and materials necessary to install the hydrant.

9. The following fire hydrants and valve boxes shall be accepted for construction by Denver Water.

   Fire Hydrants

   A. Mueller Company-Centurion Model A-473.
   B. American Flow Control/Waterous-Pacer Model WB-67-250.
   C. United States Pipe and Foundry Company-Metropolitan 250 M-94

   The following may be utilized in Distributor Contract Areas.

   a. Clow F-2545
   b. Kennedy K-81D
   c. Centurion 423

   Valve Boxes

   A. Tyler Screw–Type "C" Cast Iron valve Box Assembly Series 6860 With No. 160 Oval Base.
   B. Olympic Foundry Inc. Model No. 450VB
   C. Castings Inc. CI. 160B Oval Base
   D. East Jordan Iron Works Series 8560
   E. Star Pipe Model No. VBD160DMWW
   F. Western States Pipe Model No. VBDEN

   All valve boxes and fire hydrants will be adjusted to the final finished grade by the Contractor.

10. All bends, tees, fire hydrants, blow-offs, and plugs at dead-end mains shall be protected from thrust by using concrete thrust blocks per Denver Water Engineering Standards, Drawing 19.

11. Chlorination and Flushing: All water mains shall be installed and chlorinated per Section 8.24 of Denver Water's Engineering Standards. The lines shall be chlorinated in accordance with AWWA C-651, "Disinfecting Water Mains." The preferred method is to use sufficient chlorine tablets to produce a 25 mg/l solution. These tablets should be adhered to the top of the pipe with Permatex Clear R.T.V. Chlorination of 16-inch and larger pipe requires a chlorine slurry. The chlorination of any finished pipeline shall be completed prior to hydrostatic testing.

12. Hydrostatic Testing: All water mains shall be tested per the requirements of Section 8.25 of Denver Water's Engineering Standards. All pipe shall be field pressure tested to a minimum of 150 psi. All testing shall be done in the presence of a Denver Water Inspector. Allowable leakage for each section of pipe between line valves shall not exceed the leakage rate set forth below.

Pipe Size Inside Diameter	Allowable Leakage Per 1,000 feet Gallons Per Hour	
	DI	PVC
4-inch	.37	.33
6-inch	.55	.50
8-inch	.74	.66
12-inch	1.10	1.00
16-inch	1.47	
20-inch	1.84	

13. All valves are to be located on property line extensions except for tapping tees where an additional valve shall be placed on the tapping tee. Other valve locations may be required as shown on the plans.

14. When it is necessary to lower or raise water lines at storm drains and other utility crossings, a minimum clearance of one (1) foot shall be maintained between the outside of pipes.

15. The Contractor shall have in his possession at all times one (1) signed copy of the approved water plans.

16. Compaction of all trenches must be attained by the Contractor and the compaction test results submitted to Denver Water Construction Inspection Division.

17. All 90° bends shall be rodded, except for PVC pipe.

18. Only one point of connection will be allowed until all testing of new installations is completed.

19. The Contractor is responsible for:

    A. Notifying all customers possibly affected by outage of water during construction.
    B. The Contractor shall obtain, at his expense, all applicable licenses, permits, bonds, etc. required for the main installation/system modification.
    C. Contacting Denver Water's Construction Engineering for Pre-construction Meeting and Inspection, 303-628-6627, at least 48 hours prior to commencing construction.
    D. In case of an emergency after working hours, call Denver Water's Westside Dispatcher at 303-628-6390.

    Note: Be advised that occasionally valves in our system may be inoperable. On such occasions it may become necessary to back up an additional block for the shut out. It will then be necessary to make the additional notifications to give the affected customers the mandatory 24 hours advance notice. Also be advised that when valve maintenance is required, a delay of several days should be expected.

20. Prior to installation of water mains, road construction must have progressed to at least the "sub-grade" state. Sub-grade is defined as an elevation of no more than seven (7) inches below the finished street grade.

21. Before any taps are made from mains, application(s) for the taps must be received and approved by the Distributor and Denver Water.

22. Denver Water is to make all taps 2 inches and smaller.

23. Individual service line PRVs are required. (Use this note only when area pressure exceeds 80 psi.)

24. Meter locations shall be approved by Denver Water. It is the developer's responsibility to contact the meter shop at (303) 628-6701. (Not applicable in Master Meter Districts)

    A. All meters for Inside Denver, Total Service, and Read and Bill areas must be furnished with Itron ERTs to be installed by Denver Water at the time of meter installation or inspection.
    B. Meter pit and vault lids must have a 2-inch diameter hole for ERT.
    C. Call (303) 628-6706 to schedule an on site pre-construction meeting for all meter settings 1-1/2 inch or larger.

25. A backflow prevention device approved by Denver Water is required on the treated water service line for:

    A. All commercial and multi-family domestic taps.
    B. Taps where there is a dual water supply on the premises. (If there is a dual supply, a Dual Water Supply Agreement must be signed and provided to Denver Water.)
    C. Fire lines.

26. All combination fire line and domestic taps must be inspected and approved by Denver Water prior to the release of the water mains.

27. Denver Water personnel are <u>not</u> responsible for work site safety or compliance/enforcement of safety regulations and Standards established by other agencies. All safety compliance/enforcement at the work site shall be the Contractor's responsibility.

28. The Water Quality Control Division of The Colorado Department of Public Health and Environment (CDPHE) requires all water line contractors to possess a current Discharge Permit for discharges of chlorinated and process waters associated with the installation of new mains or conduits. Contact CDPHE Water Quality Control Division at (303) 692-3539 for information on obtaining the required permit.

29. Irrigation of medians and other public landscaped areas less than 25 feet in width must be done in accordance with Denver Water Operating Rule 12.07 (Call DW Conservation Section at 303 628-6343 for information regarding irrigation systems)
    a. For strips of land less than 6 feet in width – Spray irrigation shall be prohibited. Low-flow irrigation systems are required.
    b. For strips of land between 6 feet and 15 feet in width – Only low flow irrigation, or spray irrigation using low-angle spray nozzles designed for the specific width to be irrigated shall be permitted. All spray heads must be pressure reducing and designed to prevent low head drainage.
    c. For strips of land more than 15 feet in width – Only gear-driven rotors with low angle nozzles may be used to irrigate turf areas. Planting beds may be irrigated with low-flow or spray irrigation. All spray heads must be pressure reducing and designed to prevent low head drainage.